April 28, 1953 F. R. FORREST 2,636,720

AGITATING IMPELLER

Original Filed June 29, 1946

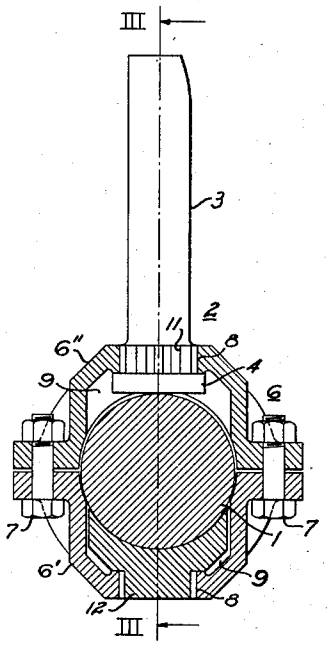


Fig. 1

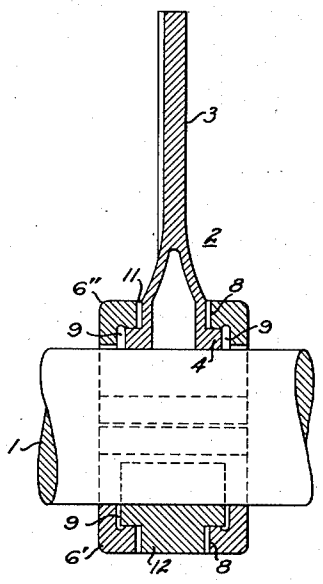


Fig. 3

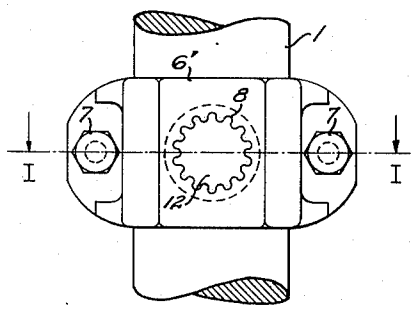


Fig. 2

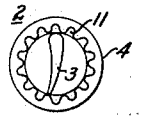


Fig. 4

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2,636,720

AGITATING IMPELLER

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Original application June 29, 1946, Serial No. 680,460. Divided and this application November 3, 1947, Serial No. 783,685

1 Claim. (Cl. 259—130)

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This invention relates to improvements in propeller elements per se and is a divisional application relating to material disclosed and claimed in application Ser. No. 680,460, filed June 29, 1946.

An object of the invention is to provide an improved type of agitating impeller for agitating pulps.

Another object concerns improved structure for a sectionalized propeller for mounting on a rotary shaft.

More specifically the invention is in the nature of a combination of clamp, blade and counterweight elements, constructed and arranged to provide a demountable, counterbalanced single blade propeller unit of novel and useful character.

The invention having the nature and objects set forth hereinabove, and other objects and advantages, can best be carried into practical effect as described hereinbelow with reference to the accompanying drawing, in which like reference characters indicate the same or similar parts throughout the several views.

Fig. 1 is a cross-sectional view of a propeller or agitator impeller assembly according to the present invention, taken on line I—I of Fig. 2;

Fig. 2 is a plan view of the impeller arrangement of Fig. 1, as viewed from below;

Fig. 3 is a longitudinal sectional view taken on line III—III of Fig. 1; and

Fig. 4 is a detail, end view of the propeller or impeller blade element as viewed looking down on Fig. 3.

The propeller or impeller assembly of this invention is shown as mounted on a rotary shaft 1; and comprises a blade member 2 formed as a main body or blade 3 of high aspect ratio and cambered, or turbine blade-like, cross section, having an enlarged circular base flange 4. The blade member is connected with main shaft 1 by a retainer ring 6 having two identical semicylindrical segments 6' and 6'' constituting a segmented ring, the segments of which are joined by suitable bolts 7.

Halves 6' and 6'' of retainer ring 6 are each provided with a splined radial hole 8. In the inner surface of retainer halves 6' and 6'', a recess 9 adjoins the inner end of hole 8, providing lateral space between the halves 6' and 6'' and the peripheral surface of any cylindrical element which may be passed therethrough.

Base flange 4 of blade 2 has such form and dimensions as to be lodgeable in recess 9 of a retainer half 6' or 6'' when the blade portion 3 is passed through hole 8 from the inside of such

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half. Base flange 4 has such form and dimensions as will prevent its passing through hole 8; and its thickness is such that it will be clamped between the inside surface surrounding hole 8 and the surface of shaft 1 with which the blade is to be connected by retainer ring 6. Blade 2 may be provided with a short splined portion 11, adjacent base flange 4, the splines of which will mesh in axially slidable relation with the splines of a hole 8 in a plurality of positions of angular adjustment about the longitudinal axis of the blade 2.

The propeller of the present invention is preferably of the single radial blade type and blade 2 is balanced by insertion of a suitably formed eccentric counterweight 12 so formed as to occupy the recess 9 and hole 8 of retainer half 6'. The eccentric mass of counterweight 12 is designed to exactly balance that of blade 2 when such blade and counterweight are securely held in position in driven relationship to shaft 1 by retainer ring or hub 6.

It will be readily understood that the blade 2 may be adjusted as to effective pitch by changing the relative angular relationship of splined portion 11 to splined hole 8, and that since the propeller unit is statically and dynamically balanced when in assembled position on a shaft 1, any desired number of such propeller units may be used axially spaced along a shaft to create an impeller of any desired length, blade pitch and spacing, useful in such a machine as is shown in the inventor's application Ser. No. 680,460 of which the present application is a division.

While a specific embodiment of the present invention is described and illustrated hereinabove, it will be understood that the invention includes such modifications and equivalents as may readily occur to persons skilled in the art within the scope of the appended claim.

It is claimed and desired to secure by Letters Patent:

A propeller structure for a power transmission member having a cylindrical portion coaxial with the axis of rotation thereof, comprising: a retainer ring surrounding said cylindrical portion comprising two generally semicylindrical segments, each of said segments having a pair of diametrically opposed radially extending flange portions for securing said ring to said power transmission member and one of said segments having a radial opening spaced circumferentially between its pair of flange portions; a blade member having an elongated body portion of size and form to pass through said opening and having a

base portion larger than said opening; the other one of said segments having an aperture spaced circumferentially between its pair of flange portions; an eccentric mass sufficient to balance the mass of said blade member having a portion receivable in said aperture and another portion having a concave cylindrical surface portion; and means to secure said retainer ring in surrounding relation to said cylindrical portion of said power transmission member in a manner to clamp said base portion of said blade member and said surface portion of said eccentric mass respectively against said power transmission member.

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